LEONIDAS E OCOLA

Physicist

Nanofabrication and Devices Group

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Argonne National Laboratory
9700 S Cass Ave., Argonne, IL 60439

Education

PhD., Physics, University of Wisconsin-Madison, USA, (1996)
M.Sc., Physics, University of Wisconsin-Madison, USA, (1991)
Lic., Physics, Universidad Nacional de Ingenieria, Peru, (1988)
B. Sc., Physics, Universidad Nacional de Ingenieria, Peru, (1988)

Awards and honors

- (2016) Program Chair of the Nanoscale Science and Technology Division, American Vacuum Society.
- (2015) Chair of the Nanoscale Science and Technology Division, American Vacuum Society.
- (2014) R&D 100 Award, "Sequential Infiltration Synthesis Lithography," Seth Darling, Jeffrey Elam, Qing Peng, Yu-Chih Tseng, David Czaplewski, Anil Mane and Leonidas Ocola
- (2013) Chair of the 57th EIPBN International Conference, Nashville, TN.
- (2010 – 2015) Steering Committee member EIPBN International Conference
- (2003) Pacesetter Award, Argonne National Laboratory for the 2003 Nanoscience Summer School at Argonne. Among the speakers: Richard Smalley (Nobel Prize Winner).
- (1995) Best Presentation (Poster or Talk), Sematech Center of Excellence CXrL Programs Review, University of Wisconsin-Madison
- (1989) Best Thesis in Physical Metallurgy, CONCYTEC [National Council of Science and Technology], Lima, Peru

Research interests

- Electron beam lithography and ion beam micromachining
- High-energy electron beam interactions with polymer materials
- Nanofabrication processes
- Nanofluidic and nano-photonic devices
- ALD infiltration in nanostructured polymers and applications

Professional Experience

University of Chicago Materials Research Science and Engineering Center (MRSEC) *2007-present*
Member of IRG III Engineering Quantum Materials and Interactions

- Support with nanofabrication expertise
- Investigate use of ALD infiltration for synthesis of novel materials

Argonne National Laboratory – Center for Nanoscale Materials *2002-present*
Physicist

- User support in nanofabrication
- Perform research projects in nanoscience and nanofabrication
- Member of design team Center for Nanoscale Materials cleanroom building and manager responsible for the purchase and installation of ~$10M of new equipment to outfit the 11,000 sq ft cleanroom for the CNM. (2002-2007). Also member of design team for the CNM cleanroom expansion of 6,000 sq ft.

LEONIDAS E OCOLA

Agere Systems, Murray Hill, NJ 2001-2002

Member Technical Staff

- Developed novel bi-layer resist process now used in production for high-power electronics
- Performed research in high resolution electron beam lithography and ebeam resist image formation

Lucent Technologies, Murray Hill, NJ 1997-2001

Member Technical Staff

- Member of SCALPEL project – 100 KV projection electron beam lithography
- Responsible for mask pattern placement metrology for SCALPEL project
- In charge of resist research for the SCALPEL project
- Developed and patented novel means to coat thin and free standing membranes without sag
- Researched and developed new models to simulate image formation in resists

Center for X-ray Lithography, University of Wisconsin 1996-1997

Research Associate

- Researched infra-red mapping of chemical modification of resists using a synchrotron beamline
- Discovered novel phenomena in latent image of negative chemically amplified resists
- Manager of a Leica EBMF 10.5 30KV ebeam tool.

Selected Publications

Selected from 130+ publications:

1. **L. E. Ocola**, D. J. Gosztola, A. Yanguas-Gil, H.-S. Suh, A. Connolly, *Proc. SPIE* 9755, 97552C, FEB (2016), Quantum Sensing and Nano Electronics and Photonics XIII; doi:10.1117/12.2209422
   "Photoluminescence of sequential infiltration synthesized ZnO nanostructures"
2. **L. E. Ocola**, M. Costales, D. J. Gosztola, *Nanotechnology* 27, 035302, JAN (2016), doi:10.1088/0957-4484/27/3/035302
   "Development characteristics of polymethyl methacrylate in alcohol/water mixtures: a lithography and Raman spectroscopy study"
3. **L. E. Ocola**, D. J. Gosztola, D. Rosenmann, G. Lopez, *J. Vac. Sci. & Technol. B* 33, 06FD02 SEP (2015); doi: 10.1116/1.4931691
   "Automated geometry assisted proximity effect correction for electron beam direct write Nanolithography"
4. **L. E. Ocola**, C. Rue, D. Maas, *MRS Bulletin* 39, 336, APR(2014), doi: 10.1557/mrs.2014.56
   "High-resolution direct-write patterning using focused ion beams"
5. **L. E. Ocola**, and E. Palacios, *J. Vac. Sci. Technol. B* 31, 06F401 AUG (2013); doi: 10.1116/1.4819302
   "Advances in ion beam micromachining for complex 3D microfluidics"
6. D. Czaplewski, and **L. E. Ocola,** *J. Vac. Sci. Technol. B* 31, 06F202, AUG (2013), doi: 10.1116/1.4818881
   "Variation of backscatter electron intensity"
7. D. A Czaplewski, M. V Holt and **L. E Ocola**, *Nanotechnology* 24 305302, JUL (2013), doi:10.1088/0957-4484/24/30/305302
   "The range and intensity of backscattered electrons for use in the creation of high fidelity electron beam lithography patterns"

Patents

1. H. Li, **L. E. Ocola**, O. H. Auciello, M. A. Firestone, US Patent 8,343,425, issued JAN (2013)
   "Multi-layer micro/nanofluid devices with bio-nanovalves"
2. **L. E. Ocola**, Agere Systems Inc., US Patent 6610464, issued AUG (2003)
   "Process for patterning a membrane"